

CLAIMS

1. A method for end-to-end admission control of real-time packet flows in a network having a plurality of network elements, the method comprising:

- 5 transmitting at least one probe packet from a first network element to a second network element via a network path;
 determining, at at least one intermediate network element on the network path, at least one flow rate associated with a plurality of packets;
10 marking at least one predetermined bit in the at least one probe packet if the at least one flow rate is greater than a predetermined rate; and
 controlling an admission of additional packets into the network based at least in part on the marking of the at least
15 one predetermined bit in the at least one probe packet.

2. The method according to claim 1 further comprising denying the admission of the additional packets into the network if the at least one predetermined bit in the at least one probe packet
20 is marked.

3. The method according to claim 1 further comprising:
 transmitting at least one second probe packet from the

second network element to the first network element via the network path;

marking at least one second predetermined bit in the at least one second probe packet if the at least one flow rate is greater than a second predetermined rate; and

controlling the admission of the additional packets into the network based at least in part on the marking of the at least one second predetermined bit in the at least one second probe packet.

4. The method according to claim 3, where the first network element echoes information associated with the at least one second predetermined bit in the at least one second probe packet in a transmission to the network.

5. The method according to claim 1, where the admission of the additional packets is based at least in part on priorities or importance of the plurality of packets and the additional packets.

6. The method according to claim 1, wherein the admission of the additional packets into the network is controlled by an entity that controls the network.

7. The method according to claim 1, where information associated with the at least one predetermined bit in the at least one probe packet is communicated to at least one of the first network element and the second network element.
8. The method according to claim 1, where the at least one intermediate network element is part of a bandwidth-limited path in the network.
9. The method according to claim 1, where the plurality of packets comprise real-time packets.
10. The method according to claim 1, where the plurality of packets comprise Internet Protocol (IP) packets.
11. The method according to claim 10, where the plurality of packets comprise voice over IP packets.
12. The method according to claim 10, where the plurality of packets comprise video over IP packets.
13. The method according to claim 10, where the plurality of

packets comprise real-time multimedia over IP packets.

14. The method according to claim 10, where the at least one
predetermined bit is part of a Differentiated Services field in
5 an IP header of the at least one probe packet.

15. The method according to claim 1, where the predetermined
rate is based on a network bandwidth allocated for the plurality
of packets.

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16. The method according to claim 15, where the predetermined
rate is raised to a value above the allocated network bandwidth
for a predetermined period of time.

15 17. The method according to claim 1 further comprising encoding
the at least one predetermined bit in the at least one probe
packet based at least in part on the at least one flow rate.

18. The method according to claim 17 further comprising
20 discontinuing at least one packet flow based on the encoded at
least one predetermined bit.

19. The method according to claim 17 further comprising

lowering a transmission rate between the first network element and the second network element or between any two network endpoints.

5 20. The method according to claim 17 further comprising suspending packet transmissions without terminating the connection between the first network element and the second network element or between any two network endpoints.

10 21. At least one signal embodied in at least one carrier wave for transmitting a computer program of instructions configured to be readable by at least one processor for instructing the at least one processor to execute a computer process for performing the method as recited in claim 1.

15 22. At least one processor readable carrier for storing a computer program of instructions configured to be readable by at least one processor for instructing the at least one processor to execute a computer process for performing the method as
20 recited in claim 1.

23. A system for end-to-end admission control of real-time packet flows in a network, the system comprising:

a first network element that transmits at least one probe packet to a second network element via a network path;

at least one intermediate network element on the network path that

5 determines at least one flow rate associated with a plurality of packets, and

marks at least one predetermined bit in the at least one probe packet if the at least one flow rate is greater than a predetermined rate; and

10 an admission control module that controls an admission of additional packets into the network based at least in part on an examination of the at least one predetermined bit in the at least one probe packet.